

KANSAS Agricultural Chemical Usage

1999 Sunflower Pesticide Summary

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Cooperative Extension Service • Kansas State University • Manhattan

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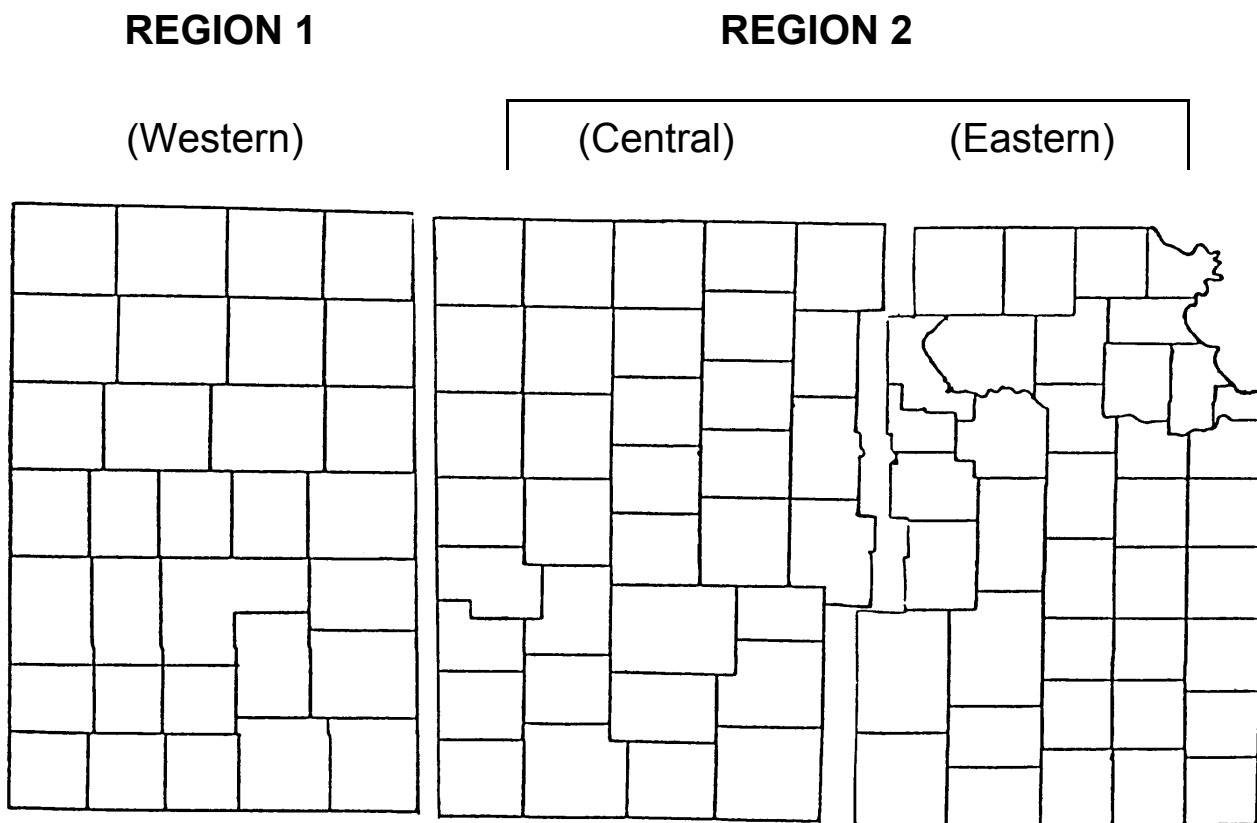
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OVERVIEW

The data presented in this publication were funded through the Cooperative Extension Service, Kansas State University, and USDA's National Pesticide Impact Assessment Program.

This initiative is designed to provide farmers and ranchers the knowledge and technical means to respond independently and voluntarily to on- and off-farm environmental concerns. In the past, farm level data have been inadequate to determine the magnitude of water quality problems or the benefits and costs of alternative solutions for the farmer and other affected parties. These data will help fill some of the data needs that analysts require to find solutions to complex environmental issues on into the next century.

On-farm fertilizer and chemical use data for 1999 Kansas Sunflower crop are included in this publication. For purposes of this survey, the State of Kansas was divided into two regions which can be described as Western & Central and Eastern Kansas. The map below outlines the boundaries that were used.



The information presented in this publication is a result of sample surveys conducted during the 1999 crop year. Chemical use data were collected for Sunflowers in October 1999. A total of 124 sample fields were selected for the 1999 Sunflower survey with 92 useable reports. No data are published in this report unless at least 3 reports were received for that particular fertilizer or pesticide application.

HIGHLIGHTS

In 1999, 280 thousand acres were planted to sunflowers in Kansas, compared to 180 thousand acres in 1998, a 56 percent increase. The largest increase occurred in the western region of the State which had a 59 percent gain. The central and eastern regions increased 47 percent. Yields averaged 1520 pounds per acre.

In 1999, nitrogen was applied to 92 percent of the sunflowers acres in Kansas, with an average application rate for the season of 61 pounds per acre. The most common method of application was by injection or knifing into the soil. Over sixty percent of the acres had nitrogen applied before planting.

Phosphate was applied to 69 percent of the sunflower acres in Kansas, with an average application rate of 23 pounds per acre. The most common method of applying phosphate was by banding. Over seventy-five percent of the phosphate applications were made at or after seeding.

There were insufficient reports to publish data for potash applications on sunflower acreage in Kansas for the 1999 crop year.

Eighty-two percent of the State's sunflower acres had some type of herbicide applied. Herbicides totaling some 221 thousand pounds were applied to these acres. The most frequently used herbicide was Pendimethalin, with 38 percent of the sunflower acres receiving an application. The average application rate for the season was 1.09 pounds per acre for a total of 116 thousand pounds. Herbicides were applied by broadcasting with or without incorporation on 79 percent of the acres treated. Most of the remaining treatments were broadcast by air. Application was made before planting on 67 percent of the acres treated. Herbicides were custom applied on 77 percent of the treated acres.

Insecticides were applied to 56 percent of the sunflower acres. Insecticide applications totaled 67 thousand pounds. Methyl parathion was the most frequently used insecticide, with 49 percent of the acres treated. The average application rate was 0.34 pounds per acre, with a total of 46 thousand pounds applied. All of the insecticides were applied after planting. Virtually all were aerially broadcast by custom applicators.

FIELD CHARACTERISTICS

TYPE PLANTED, BY REGION, 1999		
REGION	OIL	NON-OIL
----- PERCENT -----		
REGION 1	78	22
REGION 2	93	7
STATE	85	15

SEEDING RATE AND SOURCE OF SEED, BY REGION, 1999				
REGION	AVERAGE	MINIMUM	MAXIMUM	PURCHASED SEED
SEEDS PER ACRE			PERCENT	
REGION 1	18,280	14,000	27,000	100
REGION 2	21,770	15,000	30,000	100
STATE	19,780	14,000	30,000	100

PLANTING DATE AND METHOD, BY REGION, 1999				
REGION	AVERAGE PLANTING DATE	PLANTING METHOD		AVERAGE ROW WIDTH
		DRILLED	CONVENTIONAL ROWS	
		----- PERCENT -----		INCHES
REGION 1	6-8-99	9	91	30
REGION 2	6-8-99	-	100	30
STATE	6-8-99	5	95	30

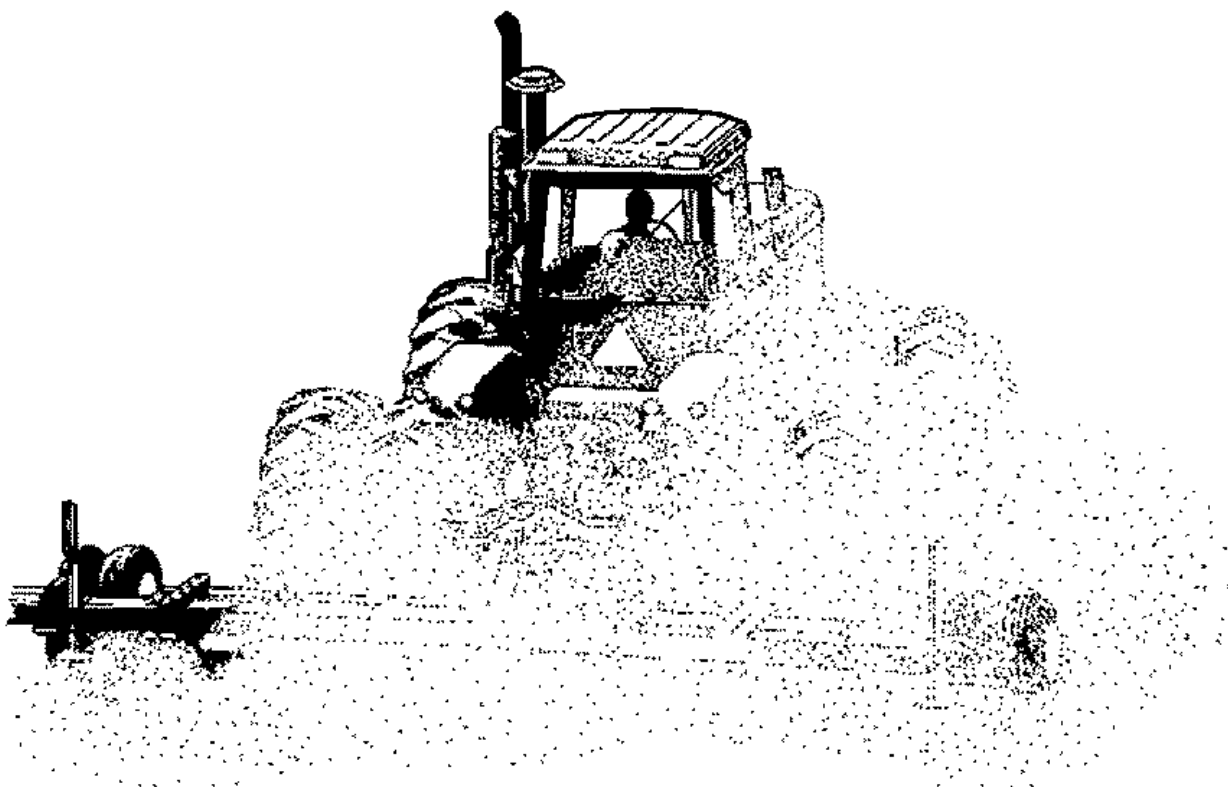
FIELD CHARACTERISTICS

SOIL CONSERVATION STRUCTURES OR PRACTICES, BY REGION, 1999				
REGION	GRASS WATERWAY	TERRACES	STRIP CROPPING	OTHER
----- PERCENT -----				
REGION 1	5	25	9	
REGION 2	36	43	<u>1/</u>	10
STATE	19	33	7	4

1/ Insufficient data to publish.

SPECIAL CLASSIFICATIONS, BY REGION, 1999		
REGION	CLASSIFIED HIGHLY ERODIBLE FIELD BY NRCS	FSA COST SHARING ASSISTANCE
----- PERCENT -----		
REGION 1	51	<u>1/</u>
REGION 2	31	<u>1/</u>
STATE	42	3

1/ Insufficient data to publish.



FERTILIZER USAGE BY TYPE OF FERTILIZER

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF FERTILIZER	PLANTED ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (Mill. Lbs) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
NITROGEN		100	1.4	42	59	11.5
PHOSPHATE		81	1.0	22	22	3.5
REGION 2	84.0					
NITROGEN		74	1.1	60	69	4.3
PHOSPHATE		40	1.0	27	27	0.9
STATE	280.0					
NITROGEN		92	1.3	45	61	15.8
PHOSPHATE		69	1.0	23	23	4.4

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient. 2/ May not add due to rounding.



NITROGEN USAGE BY APPLICATION METHOD

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
APPLICATION METHOD	PLANTED ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BRDCST W/O INCORP		20	1.4	38	52	2.1
BRDCST W/ INCORP		8	1.5	37	55	0.8
IN SEED ROW		2	1.0	34	34	0.2
INJECT/KNIFED		41	1.6	47	73	5.9
BANDED		28	1.3	36	45	2.5
FOLIAR/DIRECT SPRAY		<u>3/</u>				
REGION 2	84.0					
BRDCST W/O INCORP		20	1.4	58	83	1.4
BRDCST W/ INCORP		28	1.0	66	68	1.6
IN SEED ROW		4	1.0	45	45	0.1
INJECT/KNIFED		9	1.0	80	81	0.6
BANDED		13	1.3	40	52	0.5
FOLIAR/DIRECT SPRAY						
STATE	280.0					
BRDCST W/O INCORP		20	1.4	44	61	3.5
BRDCST W/ INCORP		14	1.2	51	63	2.4
IN SEED ROW		3	1.0	39	39	0.3
INJECT/KNIFED		32	1.5	48	74	6.6
BANDED		23	1.3	36	46	3.0
FOLIAR/DIRECT SPRAY		<u>3/</u>				

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

NITROGEN USAGE BY TIMING OF APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TIMING OF APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BEFORE SEEDING, FALL		32	1.4	47	62	3.9
BEFORE SEEDING, SPRING		38	1.7	41	67	5.0
AT SEEDING		27	1.2	33	40	2.1
AFTER SEEDING		3	2.0	45	88	0.5
REGION 2	84.0					
BEFORE SEEDING, FALL		9	1.0	86	86	0.6
BEFORE SEEDING, SPRING		31	1.1	65	73	1.9
AT SEEDING		28	1.1	49	55	1.3
AFTER SEEDING		7	1.8	50	91	0.5
STATE	280.0					
BEFORE SEEDING, FALL		25	1.3	49	64	4.6
BEFORE SEEDING, SPRING		36	1.5	45	69	6.9
AT SEEDING		27	1.2	37	45	3.4
AFTER SEEDING		4	1.9	47	90	1.0

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY STANDARD SOIL TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
SOIL TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH SOIL TEST		44	1.4	36	51	4.4
NO SOIL TEST		56	1.4	45	64	7.1
REGION 2	84.0					
WITH SOIL TEST		13	1.3	61	80	0.8
NO SOIL TEST		61	1.1	59	67	3.5
STATE	280.0					
WITH SOIL TEST		34	1.5	36	55	5.2
NO SOIL TEST		58	1.3	49	65	10.6

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY PLANT TISSUE TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
PLANT TISSUE TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
USED TISSUE TEST		-				
NO TISSUE TEST		100	1.4	41	59	11.5
REGION 2	84.0					
USED TISSUE TEST		4	1.0	82	82	0.3
NO TISSUE TEST		70	1.2	58	69	4.0
STATE	280.0					
USED TISSUE TEST		1	1.0	82	81	0.3
NO TISSUE TEST		91	1.4	44	61	15.5

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY MANURE APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
MANURE APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH MANURE		-				
WITHOUT MANURE		100	1.4	41	59	11.5
REGION 2	84.0					
WITH MANURE		4	2.0	41	80	0.3
WITHOUT MANURE		70	1.1	61	67	4.0
STATE	280.0					
WITH MANURE		1	2.0	41	80	0.3
WITHOUT MANURE		91	1.4	45	61	15.5

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY IRRIGATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
IRRIGATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
IRRIGATED		6	1.6	58	92	1.1
NON-IRRIGATED		94	1.4	40	56	10.4
REGION 2	84.0					
IRRIGATED		-				
NON-IRRIGATED		74	1.2	59	69	4.3
STATE	280.0					
IRRIGATED		4	1.6	58	92	1.1
NON-IRRIGATED		88	1.4	44	60	14.7

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE USAGE BY APPLICATION METHOD

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
APPLICATION METHOD	PLANTED ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BRDCST W/O INCORP		9	1.0	22	22	0.4
BRDCST W/ INCORP		3	1.0	32	32	0.2
IN SEED ROW		16	1.0	20	20	0.6
INJECTED/KNIFED		12	1.0	22	22	0.5
BANDED		41	1.0	24	24	1.9
REGION 2	84.0					
BRDCST W/O INCORP		7	1.0	38	38	0.2
BRDCST W/ INCORP		18	1.0	29	29	0.4
IN SEED ROW		7	1.0	24	24	0.1
INJECT/KNIFED		1	1.0	30	30	<u>3/</u>
BANDED		7	1.0	19	19	0.1
STATE	280.0					
BRDCST W/O INCORP		9	1.0	26	26	0.6
BRDCST W/ INCORP		7	1.0	30	30	0.6
IN SEED ROW		14	1.0	20	20	0.7
INJECT/KNIFED		8	1.0	23	23	0.5
BANDED		31	1.0	24	24	2.0

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

3/ Rounds to less than .1 million lbs.

PHOSPHATE USAGE BY TIMING OF APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TIMING OF APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BEFORE SEEDING, FALL		12	1.0	23	23	0.5
BEFORE SEEDING, SPRING		6	1.0	29	29	0.3
AT SEEDING		46	1.0	25	25	2.3
AFTER SEEDING		17	1.0	15	15	0.5
REGION 2	84.0					
BEFORE SEEDING, FALL		1	1.0	30	30	<u>3/</u>
BEFORE SEEDING, SPRING		12	1.0	28	28	0.3
AT SEEDING		24	1.0	25	25	0.5
AFTER SEEDING		4	1.0	52	52	0.2
STATE	280.0					
BEFORE SEEDING, FALL		9	1.0	22	22	0.6
BEFORE SEEDING, SPRING		7	1.0	28	28	0.6
AT SEEDING		40	1.0	24	24	2.7
AFTER SEEDING		13	1.0	17	17	0.6

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

3/ Rounds to less than .1 million lbs.

PHOSPHATE USAGE BY STANDARD SOIL TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
SOIL TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH SOIL TEST		43	1.0	24	24	2.0
NO SOIL TEST		38	1.0	22	22	1.6
REGION 2	84.0					
WITH SOIL TEST		5	1.0	45	45	0.2
NO SOIL TEST		35	1.0	26	26	0.8
STATE	280.0					
WITH SOIL TEST		31	1.0	25	25	2.2
NO SOIL TEST		38	1.0	22	22	2.3

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE BY PLANT TISSUE TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
PLANT TISSUE TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
USED TISSUE TEST		-				
NO TISSUE TEST		81	1.0	23	23	3.5
REGION 2	84.0					
USED TISSUE TEST		-				
NO TISSUE TEST		40	1.0	28	28	0.9
STATE	280.0					
USED TISSUE TEST		-				
NO TISSUE TEST		69	1.0	23	23	4.4

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE USAGE BY MANURE APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
MANURE APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH MANURE		-				
WITHOUT MANURE		81	1.0	22	22	3.5
REGION 2	84.0					
WITH MANURE		4	1.0	52	52	0.2
WITHOUT MANURE		36	1.0	26	26	0.8
STATE	280.0					
WITH MANURE		1	1.0	49	49	0.1
WITHOUT MANURE		68	1.0	22	22	4.3

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE USAGE BY IRRIGATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
IRRIGATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
IRRIGATED		6	1.0	24	24	0.3
NON-IRRIGATED		75	1.0	22	22	3.2
REGION 2	84.0					
IRRIGATED		-				
NON-IRRIGATED		40	1.0	28	28	1.0
STATE	280.0					
IRRIGATED		4	1.0	23	23	0.3
NON-IRRIGATED		65	1.0	23	23	4.1

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

GENERAL FERTILIZER PRACTICES

SPECIAL PRACTICES, BY REGION, 1999		
REGION	PERFORMED SOIL TEST	PERFORMED PLANT TISSUE TEST
----- PERCENT -----		
REGION 1	31	-
REGION 2	14	2
STATE	24	1

SPECIAL PRACTICES, BY REGION, 1999				
REGION	PERFORMED STANDARD SOIL TESTS IN 1998 OR 1999	PERFORMED PLANT TISSUE TESTS IN 1998 OR 1999	PERFORMED A NITROGEN SOIL TEST	POUNDS OF NITROGEN RECOMMENDED BY TEST
----- PERCENT -----		PERCENT		
REGION 1	31	-	27	60
REGION 2	14	<u>1/</u>	21	68
STATE	24	<u>1/</u>	25	63

1/ Insufficient data to publish.

AMOUNT OF NITROGEN APPLIED, BY REGION, 1999						
REGION	BASED ON					
	ROUTINE PRACTICE	SOIL OR TISSUE TEST	CONSULTANT RECOMMEN- DATION	FERTILIZER DEALER RECOMMEN- -DATION	EXTENSION SERVICE RECOMMEN- -DATION	COST OF NITROGEN OR COMMODITY PRICE
----- PERCENT -----						
REGION 1	64	20	18	20	<u>1/</u>	7
REGION 2	72	17	10	7	-	10
STATE	67	19	15	15	<u>1/</u>	8

1/ Insufficient data to publish.

GENERAL FERTILIZER PRACTICES

LIME APPLICATION, BY REGION, 1999			
REGION	LIME APPLIED	AVERAGE TIME BETWEEN APPLICATIONS	AVERAGE APPLICATION RATES
	PERCENT	YEARS	TONS PER ACRE
REGION 1	<u>1/</u>	<u>1/</u>	<u>1/</u>
REGION 2	14	7	2.3
STATE	7	6	2.4

1/ Insufficient data to publish.

SULFUR APPLICATIONS, BY REGION, 1999		
REGION	SULFUR APPLIED	RATE PER APPLICATION
	PERCENT	POUNDS PER ACRE
REGION 1	9	6
REGION 2	<u>1/</u>	<u>1/</u>
STATE	6	6

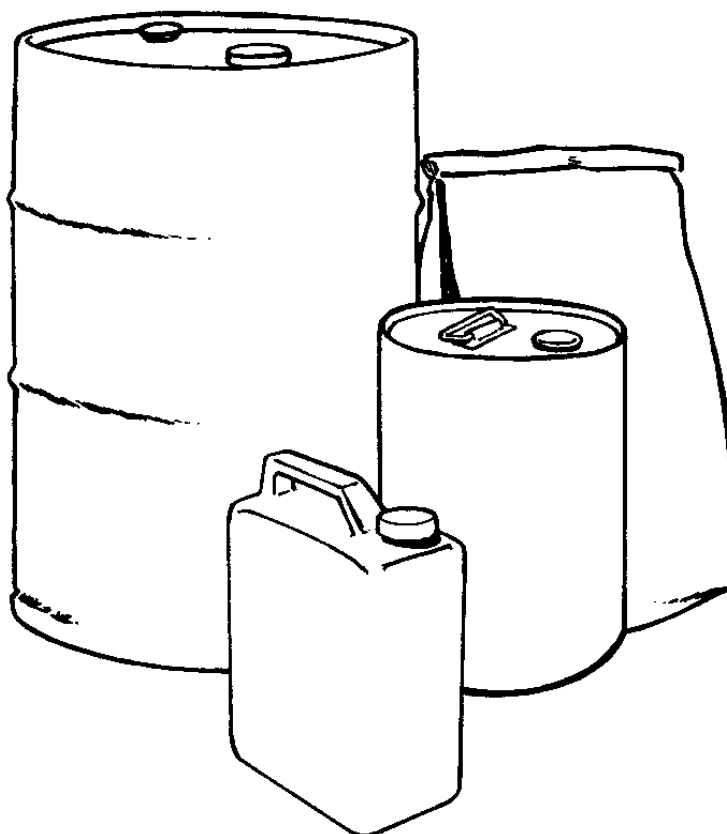
1/ Insufficient data to publish.

MICRONUTRIENTS, BY REGION, 1999		
REGION	MICRO NUTRIENTS APPLIED	THOSE WHO APPLIED MICRO NUTRIENTS APPLIED THE FOLLOWING PRODUCT
		ZINC
		----- PERCENT -----
REGION 1	7	100
REGION 2	7	100
STATE	7	100

PESTICIDE USAGE BY TYPE OF PESTICIDE

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND TOTAL POUNDS APPLIED, BY REGION, 1999			
TYPE OF PESTICIDE	PLANTED ACRES		TOTAL LBS. APPLIED (000)
	ASB ACRES (000)	PCT TREATED <u>1/</u>	
REGION 1	196.0		
HERBICIDES		96	171.0
INSECTICIDES		65	62.0
REGION 2	84.0		
HERBICIDES		52	50.0
INSECTICIDES		34	5.0
STATE	280.0		
HERBICIDES		82	221.0
INSECTICIDES		56	67.0

1/ Refers to acres receiving one or more applications of a specific pesticide ingredient.



PESTICIDE USAGE BY ACTIVE INGREDIENTS

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF PESTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
HERBICIDES <u>3/</u>						
REGION 1	196.0					
PENDIMETHALIN		37	1.0	1.06	1.06	76.8
GLYPHOSATE		26	1.4	0.58	0.81	40.4
TRIFLURALIN		17	1.0	0.77	0.77	26.2
SETHOXYDIM		<u>4/</u>				
SULFENTRAZONE		6	1.0	0.19	0.19	2.2
ETHALFLURALIN		<u>4/</u>				
REGION 2	84.0					
PENDIMETHALIN		41	1.1	1.08	1.15	39.2
GLYPHOSATE		12	1.1	0.43	0.46	4.6
TRIFLURALIN		6	1.0	0.92	0.92	4.6
SETHOXYDIM		<u>4/</u>				
SULFENTRAZONE		-				
ETHALFLURALIN		<u>4/</u>				
STATE	280.0					
PENDIMETHALIN		38	1.0	1.07	1.09	116.0
GLYPHOSATE		21	1.3	0.56	0.76	45.0
TRIFLURALIN		14	1.0	0.79	0.79	31.0
SETHOXYDIM		12	1.0	0.37	0.37	12.0
SULFENTRAZONE		4	1.0	0.19	0.19	2.2
ETHALFLURALIN		1	1.0	0.91	0.91	1.6
INSECTICIDES <u>5/</u>						
REGION 1	196.0					
METHYL PARATHION		63	1.1	0.32	0.36	43.7
ESFENVALERATE		45	1.0	0.03	0.03	2.5
LAMBDA-CYHALOTHRIN		4	1.0	0.02	0.02	0.1
CYFLURATHRIN		-				
CARBOFURAN		-				
REGION 2	84.0					
METHYL PARATHION		15	1.0	0.19	0.19	2.3
ESFENVALERATE		14	1.1	0.04	0.04	0.5
LAMBDA-CYHALOTHRIN		12	1.0	0.02	0.02	0.2
CYFLURATHRIN		6	1.0	0.04	0.04	0.2
CARBOFURAN		6	1.0	0.20	0.20	1.0
STATE	280.0					
METHYL PARATHION		49	1.1	0.31	0.34	46.0
ESFENVALERATE		32	1.0	0.03	0.03	3.0
LAMBDA-CYHALOTHRIN		5	1.0	0.02	0.02	0.3
CYFLURATHRIN		2	1.0	0.04	0.04	0.2
CARBOFURAN		2	1.0	0.20	0.20	1.0

1/ Refers to acres receiving one or more applications of a specific pesticide ingredient.

2/ May not add due to rounding.

3/ Herbicides reported but not published due to insufficient data include 2, 4-D, Dicamba, and Metolachlor.

4/ Insufficient data to publish.

5/ Insecticides reported but not published due to insufficient data include Chlorpyrifos and Endosulfan.

HERBICIDE USAGE BY TARGET PEST

ANNUAL GRASSES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		16	1.0	0.96	0.96	30.3
GLYPHOSATE		15	1.1	0.55	0.60	18.2
REGION 2	84.0					
PENDIMETHALIN		10.0	1.3	0.95	1.19	10.1
GLYPHOSATE		<u>3/</u>				
STATE	280.0					
PENDIMETHALIN		14	1.1	0.96	1.03	40.4
GLYPHOSATE		12	1.1	0.55	0.58	19.4

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

FOXTAIL

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		<u>3/</u>				
REGION 2	84.0					
PENDIMETHALIN		<u>3/</u>				
STATE	280.0					
PENDIMETHALIN		3	1.0	1.35	1.35	12.8

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

PERENNIAL GRASSES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		<u>3/</u>				
REGION 2	84.0					
PENDIMETHALIN		6	1.0	0.98	0.98	5.3
STATE	280.0					
PENDIMETHALIN		2	1.0	0.88	0.88	5.7

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

ANNUAL BROADLEAVES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
TRIFLURALIN		16	1.0	0.76	0.76	23.2
PENDIMETHALIN		6	1.0	1.33	1.33	14.7
GLYPHOSATE		<u>3/</u>				
REGION 2	84.0					
TRIFLURALIN		-				
PENDIMETHALIN		7	1.0	1.14	1.14	6.9
GLYPHOSATE		<u>3/</u>				
STATE	280.0					
TRIFLURALIN		11	1.0	0.76	0.76	23.2
PENDIMETHALIN		6	1.0	1.26	1.26	21.6
GLYPHOSATE		3	1.0	0.42	0.42	3.4

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

PIGWEEED

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
GLYPHOSATE		6	1.0	0.53	0.53	6.3
PENDIMETHALIN		3	1.0	0.87	0.87	4.3
REGION 2	84.0					
GLYPHOSATE		<u>3/</u>				
PENDIMETHALIN		-				
STATE	280.0					
GLYPHOSATE		4	1.0	0.53	0.53	6.4
PENDIMETHALIN		2	1.0	0.87	0.87	4.3

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

KOCHIA

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
GLYPHOSATE		<u>3/</u>				
REGION 2	84.0					
GLYPHOSATE		<u>3/</u>				
STATE	280.0					
GLYPHOSATE		7	1.0	0.73	0.73	13.3

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

ALL BROADLEAVES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		-				
REGION 2	84.0					
PENDIMETHALIN		14	1.0	1.26	1.26	14.7
STATE	280.0					
PENDIMETHALIN		4	1.0	1.26	1.26	14.7

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.



INSECTICIDE USAGE BY TARGET PEST

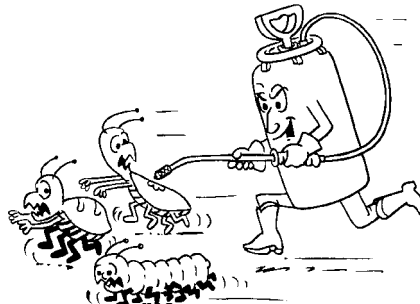
SUNFLOWER MOTH

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
METHYL PARATHION		24	1.0	0.38	0.38	17.7
CYFLUTHRIN		-				
REGION 2	84.0					
METHYL PARATHION		-				
CYFLUTHRIN		5	1.0	0.04	0.04	0.2
STATE	280.0					
METHYL PARATHION		16	1.0	0.38	0.38	17.7
CYFLUTHRIN		1	1.0	0.04	0.04	0.2

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.



INSECTICIDE USAGE BY TARGET PEST

STEM WEEVIL

TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI-CATIONS	RATE PER APPLI-CATION	RATE PER CROP YEAR	
REGION 1	196.0					
ESFENVALERATE		24	1.0	0.03	0.03	1.4
REGION 2	84.0					
ESFENVALERATE		-				
STATE	280.0					
ESFENVALERATE		17	1.0	0.03	0.03	1.4

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

INSECTICIDE USAGE BY TARGET PEST

SEED WEEVIL

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI-CATIONS	RATE PER APPLI-CATION	RATE PER CROP YEAR	
REGION 1	196.0					
METHYL PARATHION		15	1.0	0.39	0.39	11.3
ESFENVALERATE		17	1.0	0.04	0.04	1.2
REGION 2	84.0					
METHYL PARATHION		-				
ESFENVALERATE		-				
STATE	280.0					
METHYL PARATHION		10	1.0	0.39	0.39	11.3
ESFENVALERATE		12	1.0	0.04	0.04	1.2

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

INSECTICIDE USAGE BY TARGET PEST

MOTH/CATERPILLAR

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
METHYL PARATHION		11	1.7	0.32	0.53	11.3
LAMBDA-CYHALOTHRIN		-				
ESFENVALERATE		-				
REGION 2	84.0					
METHYL PARATHION		6	1.0	0.28	0.28	1.4
LAMBDA-CYHALOTHRIN		10	1.0	0.02	0.02	0.2
ESFENVALERATE		4	1.2	0.06	0.08	0.2
STATE	280.0					
METHYL PARATHION		9	1.5	0.31	0.31	12.7
LAMBDA-CYHALOTHRIN		5	1.0	0.02	0.02	0.3
ESFENVALERATE		1	1.2	0.06	0.08	0.2

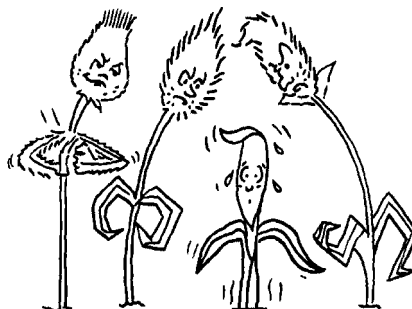
1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

HERBICIDE USAGE BY APPLICATION METHOD

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATION METHOD	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
BRDCST W/O INCORP		38
BRDCST W/ INCORP		34
BROADCAST AIR		20
FOLIAR/DIRECT SPRAY		4
REGION 2	84.0	
BRDCST W/O INCORP		40
BRDCST W/ INCORP		10
BROADCAST AIR		2
FOLIAR/DIRECT SPRAY		-
STATE	280.0	
BRDCST W/O INCORP		38
BRDCST W/ INCORP		27
BROADCAST AIR		15
FOLIAR/DIRECT SPRAY		2

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.



HERBICIDE USAGE BY TIMING OF APPLICATION

TOTAL ACREAGE AND PERCENT OF ACRES TREATED BY REGION, 1999		
TIMING OF APPLICATION	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
BEFORE PLANTING		65
AFTER PLANTING		30
REGION 2	84.0	
BEFORE PLANTING		34
AFTER PLANTING		18
STATE	280.0	
BEFORE PLANTING		55
AFTER PLANTING		27

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

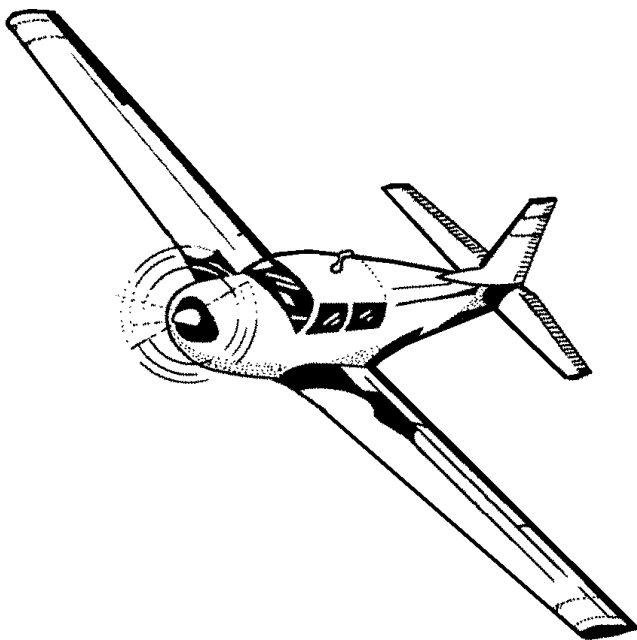


HERBICIDE USAGE BY APPLICATOR

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATOR	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
OPERATOR		20
CUSTOM		75
EMPLOYEE/OTHER		<u>2/</u>
REGION 2	84.0	
OPERATOR		14
CUSTOM		38
EMPLOYEE/OTHER		-
STATE	280.0	
OPERATOR		18
CUSTOM		63
EMPLOYEE/OTHER		<u>2/</u>

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ Insufficient data to publish.

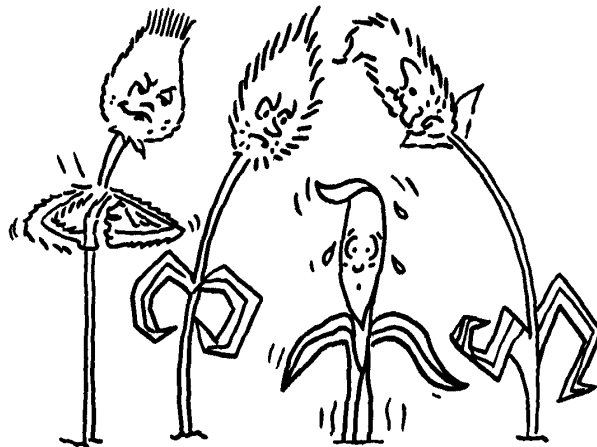


INSECTICIDE USAGE BY APPLICATION METHOD

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATION METHOD	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED ^{1/}
REGION 1	196.0	
BROADCAST AIR		65
FOLIAR/DIRECT SPRAY		-
IN SEED FURROW		-
REGION 2	84.0	
BROADCAST AIR		27
FOLIAR/DIRECT SPRAY		<u>2/</u>
IN SEED FURROW		<u>2/</u>
STATE	280.0	
BROADCAST AIR		<u>54</u>
FOLIAR/DIRECT SPRAY		<u>2/</u>
IN SEED FURROW		<u>2/</u>

^{1/} Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ Insufficient data to publish.



INSECTICIDE USAGE BY APPLICATOR

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATOR	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
OPERATOR		-
CUSTOM		65
REGION 2	84.0	
OPERATOR		<u>2/</u>
CUSTOM		30
STATE	280.0	
OPERATOR		<u>2/</u>
CUSTOM		55

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ Insufficient data to publish.

RECORDS USE

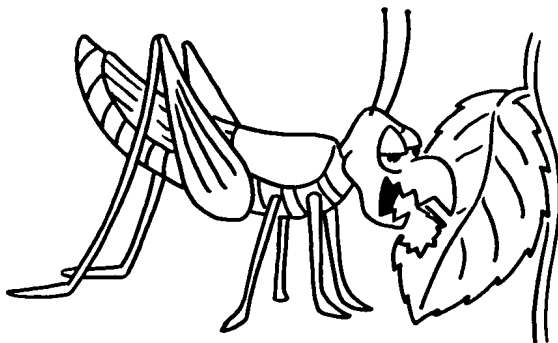
USE OF RECORDS TO PROVIDE SURVEY DATA, BY REGION, 1999		
REGION	FERTILIZER	PESTICIDE
	----- PERCENT -----	
REGION 1	60	56
REGION 2	33	45
STATE	48	52

PEST MANAGEMENT PRACTICES

FIELD SCOUTING FOR PESTS, BY REGION, 1999					
PEST BY REGION	SCOUTED PERCENT	BY			
		OPERATOR	EMPLOYEE	DEALER	CONSULTANT
		----- PERCENT -----			
FOR WEEDS					
REGION 1	93	82	<u>1/</u>	<u>1/</u>	12
REGION 2	67	89	<u>1/</u>	<u>1/</u>	<u>1/</u>
STATE	81	85	<u>1/</u>	4	9
FOR INSECTS					
REGION 1	95	77	-	10	13
REGION 2	79	85	<u>1/</u>	9	<u>1/</u>
STATE	88	80	<u>1/</u>	9	9
FOR DISEASES					
REGION 1	91	80	-	8	12
REGION 2	64	81	<u>1/</u>	<u>1/</u>	<u>1/</u>
STATE	79	81	<u>1/</u>	8	10

1/ Insufficient data to publish.

RECORDS OF SCOUTING, BY REGION, 1999	
REGION	KEPT RECORDS ON PEST ACTIVITY OR LEVEL
----- PERCENT OF FIELDS -----	
REGION 1	19
REGION 2	18
STATE	19



PEST MANAGEMENT PRACTICES

APPLIED PRE-EMERGENCE HERBICIDES, BY REGION, 1999					
REGION	APPLIED PERCENT	BASED ON			
		ROUTINE TREATMENT	FIELD MAPPING	RECOMMENDATION BY CHEMICAL DEALER	CROP CONSULTANT
		----- PERCENT -----			
REGION 1	75	85	<u>1/</u>	17	10
REGION 2	71	90	<u>1/</u>	17	13
STATE	73	87	<u>1/</u>	17	11

1/ Insufficient data to publish.

APPLIED POST-EMERGENCE HERBICIDES, BY REGION, 1999					
REGION	APPLIED PERCENT	BASED ON			
		ROUTINE TREATMENT	TYPE &/OR DENSITY OF WEEDS	RECOMMENDATION BY CHEMICAL DEALER	CROP CONSULTANT
		----- PERCENT -----			
REGION 1	20	91	36	36	<u>1/</u>
REGION 2	14	50	50	<u>1/</u>	-
STATE	18	76	41	29	<u>1/</u>

1/ Insufficient data to publish.

APPLIED INSECTICIDES, BY REGION, 1999					
REGION	BASED ON				
	PREVENTATIVE SCHEDULE	SCOUTING DATA COMPARED TO UNIV. GUIDELINES	STANDARD PRACTICES	LOCAL INFORMATION	OPERATOR'S DETERMINATION OF INFESTATION
----- PERCENT -----					
REGION 1	19	43	29	<u>1/</u>	52
REGION 2	20	32	36	-	64
STATE	20	37	33	<u>1/</u>	59

1/ Insufficient data to publish.

PEST MANAGEMENT PRACTICES

PEST CONTROL PRACTICES, BY REGION, 1999			
MANAGEMENT PRACTICE	REGION		
	1	2	STATE
	PERCENT OF PRODUCERS		
PROTECTION OF BENEFICIAL ORGANISMS	15	19	16
USE OF BENEFICIAL ORGANISMS	<u>1/</u>	7	5
USE OF WATER MANAGEMENT PRACTICES	<u>1/</u>	<u>1/</u>	3
TILLING, MOWING, BURNING, OR CHOPPING FIELD EDGES	25	21	24
CLEAN EQUIPMENT AND IMPLEMENTS	36	31	34
CULTIVATED FOR WEED CONTROL	47	19	35
PEST-RESISTANT SEED VARIETY	18	24	21
TREATED SEED	13	33	22
ADJUST PLANTING OR HARVESTING DATE	31	36	33
ALTERNATING PESTICIDES	22	36	28
ADJUST ROW SPACING OR PLANT DENSITY	11	<u>1/</u>	7
CROP ROTATION PAST 3 YEARS	56	76	65

1/ Insufficient data to publish.

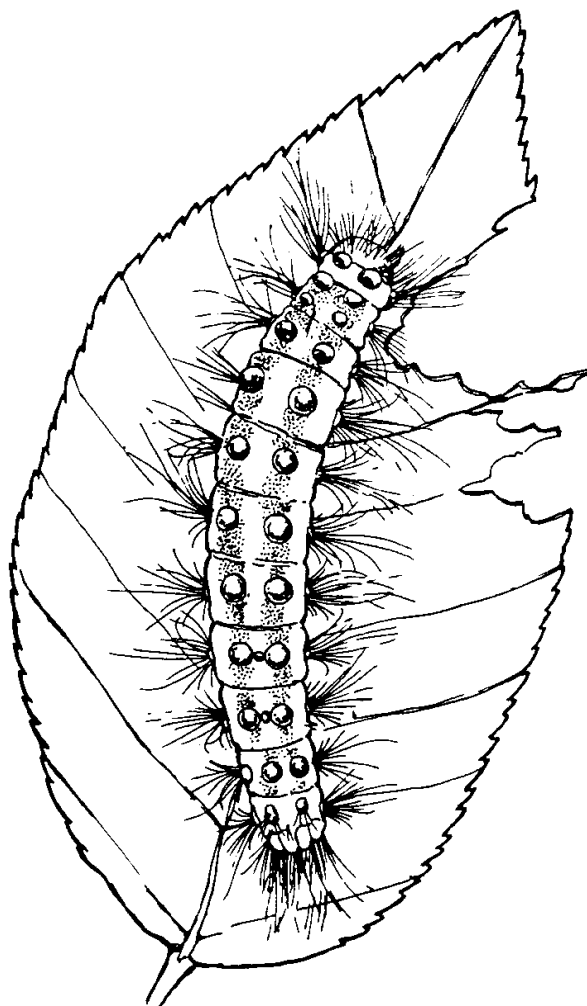
PEST MANAGEMENT PRACTICES

INFORMATION SOURCES, BY REGION, 1999				
REGION	UNIVERSITY RESEARCH AND EXTENSION	FARM SUPPLY OR CHEMICAL DEALER	COMMERCIAL SCOUTING	CROP CONSULTANT
----- PERCENT -----				
REGION 1	15	33	<u>1</u> /	18
REGION 2	31	36	<u>1</u> /	<u>1</u> /
STATE	22	34	<u>1</u> /	12
REGION	OTHER GROWERS	PRODUCER ASSOCIATION	OTHER	NONE
----- PERCENT -----				
REGION 1	16	<u>1</u> /	9	5
REGION 2	<u>1</u> /	<u>1</u> /	<u>1</u> /	12
STATE	11	3	7	8

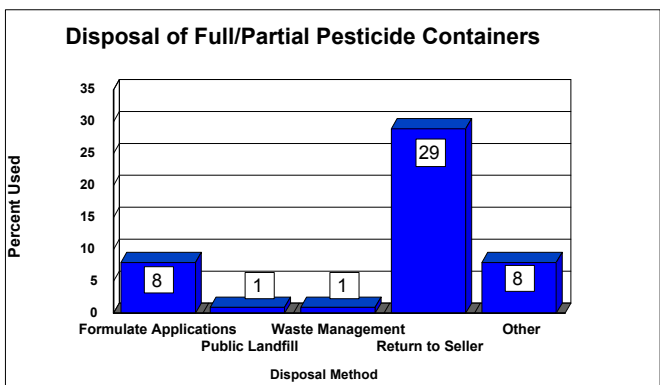
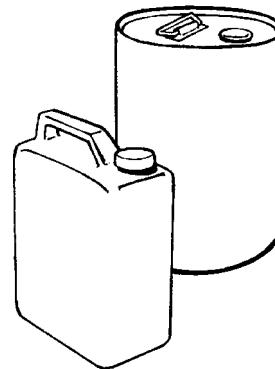
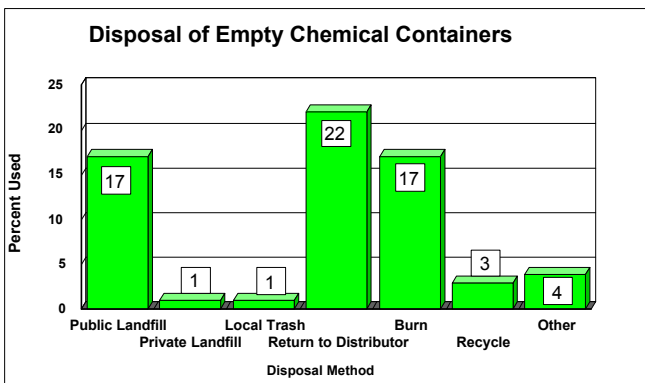
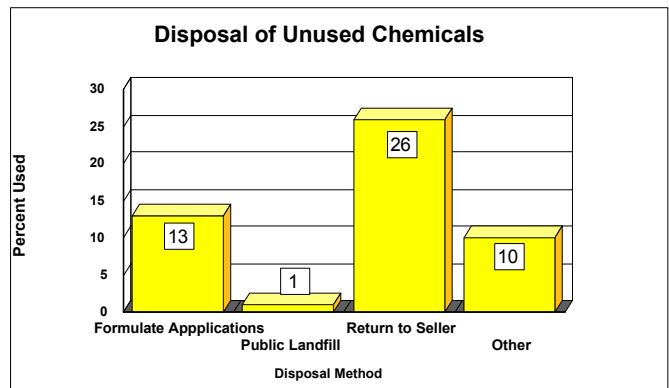
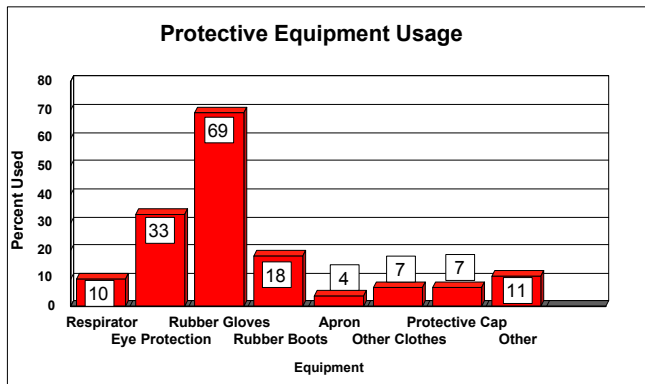
1/ Insufficient data to publish.

PEST MANAGEMENT PRACTICES

PESTICIDE USE TRAINING, BY REGION, 1999		
REGION	OPERATOR ATTENDED TRAINING OF PEST IDENTIFICATION AND MANAGEMENT SINCE OCTOBER 1, 1998	OPERATOR CERTIFIED TO APPLY "RESTRICTED USE" PESTICIDES
	----- PERCENT -----	
REGION 1	24	71
REGION 2	19	62
STATE	22	67



HANDLING OF CHEMICALS



Donald C. Cress
Extension Pesticide Coordinator
(785) 532-5891

For specific questions on pesticide and fertilizer use, contact the following
Kansas State University Extension Specialists:

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Curtis Thompson, Extension Specialist, Crop and Soils

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Bob Bowden, Extension Plant Pathology
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Dave Whitney, Extension Soil Testing

For specific questions on survey mechanics and data analysis, contact Eldon
J. Thiessen, Kansas Department of Agriculture, Division of Statistics, Topeka, KS
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Eldon J. Thiessen, State Statistician
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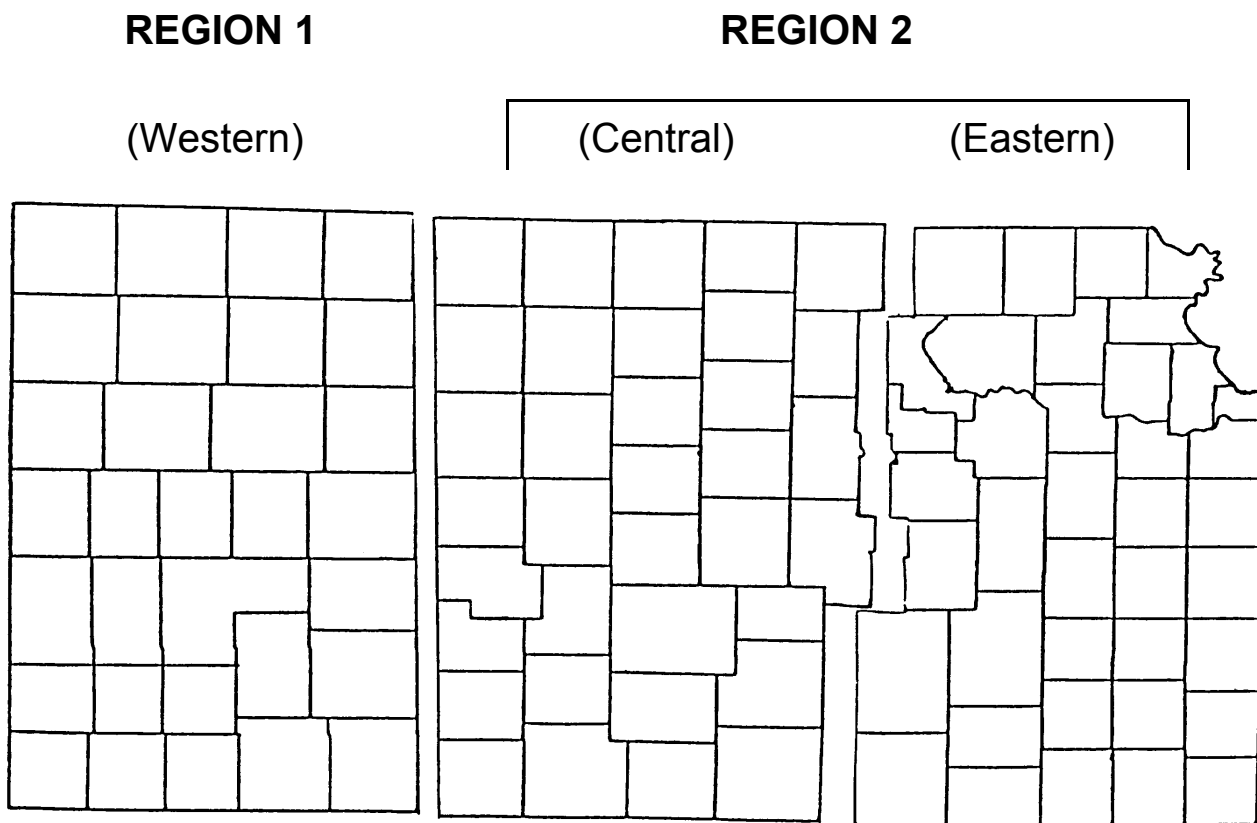
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OVERVIEW

The data presented in this publication were funded through the Cooperative Extension Service, Kansas State University, and USDA's National Pesticide Impact Assessment Program.

This initiative is designed to provide farmers and ranchers the knowledge and technical means to respond independently and voluntarily to on- and off-farm environmental concerns. In the past, farm level data have been inadequate to determine the magnitude of water quality problems or the benefits and costs of alternative solutions for the farmer and other affected parties. These data will help fill some of the data needs that analysts require to find solutions to complex environmental issues on into the next century.

On-farm fertilizer and chemical use data for 1999 Kansas Sunflower crop are included in this publication. For purposes of this survey, the State of Kansas was divided into two regions which can be described as Western & Central and Eastern Kansas. The map below outlines the boundaries that were used.



The information presented in this publication is a result of sample surveys conducted during the 1999 crop year. Chemical use data were collected for Sunflowers in October 1999. A total of 124 sample fields were selected for the 1999 Sunflower survey with 92 useable reports. No data are published in this report unless at least 3 reports were received for that particular fertilizer or pesticide application.

HIGHLIGHTS

In 1999, 280 thousand acres were planted to sunflowers in Kansas, compared to 180 thousand acres in 1998, a 56 percent increase. The largest increase occurred in the western region of the State which had a 59 percent gain. The central and eastern regions increased 47 percent. Yields averaged 1520 pounds per acre.

In 1999, nitrogen was applied to 92 percent of the sunflowers acres in Kansas, with an average application rate for the season of 61 pounds per acre. The most common method of application was by injection or knifing into the soil. Over sixty percent of the acres had nitrogen applied before planting.

Phosphate was applied to 69 percent of the sunflower acres in Kansas, with an average application rate of 23 pounds per acre. The most common method of applying phosphate was by banding. Over seventy-five percent of the phosphate applications were made at or after seeding.

There were insufficient reports to publish data for potash applications on sunflower acreage in Kansas for the 1999 crop year.

Eighty-two percent of the State's sunflower acres had some type of herbicide applied. Herbicides totaling some 221 thousand pounds were applied to these acres. The most frequently used herbicide was Pendimethalin, with 38 percent of the sunflower acres receiving an application. The average application rate for the season was 1.09 pounds per acre for a total of 116 thousand pounds. Herbicides were applied by broadcasting with or without incorporation on 79 percent of the acres treated. Most of the remaining treatments were broadcast by air. Application was made before planting on 67 percent of the acres treated. Herbicides were custom applied on 77 percent of the treated acres.

Insecticides were applied to 56 percent of the sunflower acres. Insecticide applications totaled 67 thousand pounds. Methyl parathion was the most frequently used insecticide, with 49 percent of the acres treated. The average application rate was 0.34 pounds per acre, with a total of 46 thousand pounds applied. All of the insecticides were applied after planting. Virtually all were aerially broadcast by custom applicators.

FIELD CHARACTERISTICS

TYPE PLANTED, BY REGION, 1999		
REGION	OIL	NON-OIL
----- PERCENT -----		
REGION 1	78	22
REGION 2	93	7
STATE	85	15

SEEDING RATE AND SOURCE OF SEED, BY REGION, 1999				
REGION	AVERAGE	MINIMUM	MAXIMUM	PURCHASED SEED
SEEDS PER ACRE			PERCENT	
REGION 1	18,280	14,000	27,000	100
REGION 2	21,770	15,000	30,000	100
STATE	19,780	14,000	30,000	100

PLANTING DATE AND METHOD, BY REGION, 1999				
REGION	AVERAGE PLANTING DATE	PLANTING METHOD		AVERAGE ROW WIDTH
		DRILLED	CONVENTIONAL ROWS	
		----- PERCENT -----		INCHES
REGION 1	6-8-99	9	91	30
REGION 2	6-8-99	-	100	30
STATE	6-8-99	5	95	30

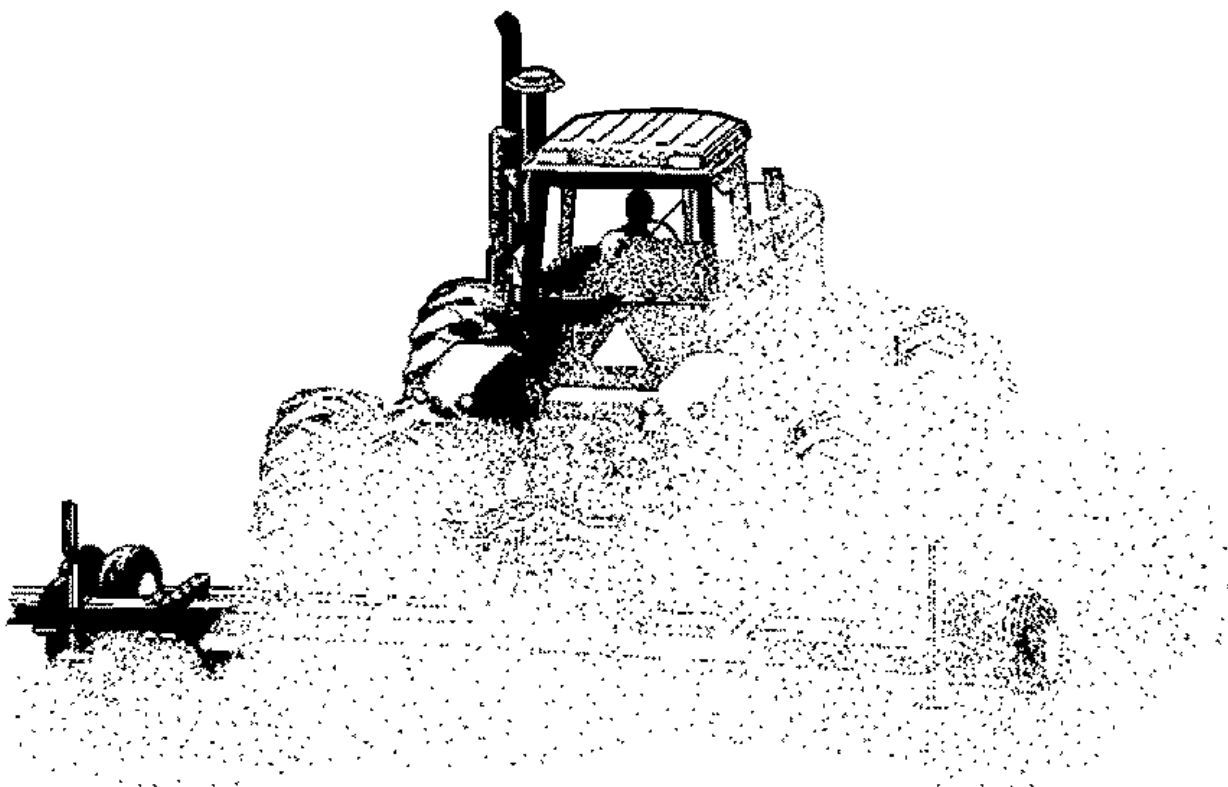
FIELD CHARACTERISTICS

SOIL CONSERVATION STRUCTURES OR PRACTICES, BY REGION, 1999				
REGION	GRASS WATERWAY	TERRACES	STRIP CROPPING	OTHER
----- PERCENT -----				
REGION 1	5	25	9	
REGION 2	36	43	<u>1/</u>	10
STATE	19	33	7	4

1/ Insufficient data to publish.

SPECIAL CLASSIFICATIONS, BY REGION, 1999		
REGION	CLASSIFIED HIGHLY ERODIBLE FIELD BY NRCS	FSA COST SHARING ASSISTANCE
----- PERCENT -----		
REGION 1	51	<u>1/</u>
REGION 2	31	<u>1/</u>
STATE	42	3

1/ Insufficient data to publish.



FERTILIZER USAGE BY TYPE OF FERTILIZER

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF FERTILIZER	PLANTED ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (Mill. Lbs) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
NITROGEN		100	1.4	42	59	11.5
PHOSPHATE		81	1.0	22	22	3.5
REGION 2	84.0					
NITROGEN		74	1.1	60	69	4.3
PHOSPHATE		40	1.0	27	27	0.9
STATE	280.0					
NITROGEN		92	1.3	45	61	15.8
PHOSPHATE		69	1.0	23	23	4.4

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient. 2/ May not add due to rounding.



NITROGEN USAGE BY APPLICATION METHOD

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
APPLICATION METHOD	PLANTED ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BRDCST W/O INCORP		20	1.4	38	52	2.1
BRDCST W/ INCORP		8	1.5	37	55	0.8
IN SEED ROW		2	1.0	34	34	0.2
INJECT/KNIFED		41	1.6	47	73	5.9
BANDED		28	1.3	36	45	2.5
FOLIAR/DIRECT SPRAY		<u>3/</u>				
REGION 2	84.0					
BRDCST W/O INCORP		20	1.4	58	83	1.4
BRDCST W/ INCORP		28	1.0	66	68	1.6
IN SEED ROW		4	1.0	45	45	0.1
INJECT/KNIFED		9	1.0	80	81	0.6
BANDED		13	1.3	40	52	0.5
FOLIAR/DIRECT SPRAY						
STATE	280.0					
BRDCST W/O INCORP		20	1.4	44	61	3.5
BRDCST W/ INCORP		14	1.2	51	63	2.4
IN SEED ROW		3	1.0	39	39	0.3
INJECT/KNIFED		32	1.5	48	74	6.6
BANDED		23	1.3	36	46	3.0
FOLIAR/DIRECT SPRAY		<u>3/</u>				

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

NITROGEN USAGE BY TIMING OF APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TIMING OF APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BEFORE SEEDING, FALL		32	1.4	47	62	3.9
BEFORE SEEDING, SPRING		38	1.7	41	67	5.0
AT SEEDING		27	1.2	33	40	2.1
AFTER SEEDING		3	2.0	45	88	0.5
REGION 2	84.0					
BEFORE SEEDING, FALL		9	1.0	86	86	0.6
BEFORE SEEDING, SPRING		31	1.1	65	73	1.9
AT SEEDING		28	1.1	49	55	1.3
AFTER SEEDING		7	1.8	50	91	0.5
STATE	280.0					
BEFORE SEEDING, FALL		25	1.3	49	64	4.6
BEFORE SEEDING, SPRING		36	1.5	45	69	6.9
AT SEEDING		27	1.2	37	45	3.4
AFTER SEEDING		4	1.9	47	90	1.0

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY STANDARD SOIL TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
SOIL TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH SOIL TEST		44	1.4	36	51	4.4
NO SOIL TEST		56	1.4	45	64	7.1
REGION 2	84.0					
WITH SOIL TEST		13	1.3	61	80	0.8
NO SOIL TEST		61	1.1	59	67	3.5
STATE	280.0					
WITH SOIL TEST		34	1.5	36	55	5.2
NO SOIL TEST		58	1.3	49	65	10.6

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY PLANT TISSUE TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
PLANT TISSUE TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
USED TISSUE TEST		-				
NO TISSUE TEST		100	1.4	41	59	11.5
REGION 2	84.0					
USED TISSUE TEST		4	1.0	82	82	0.3
NO TISSUE TEST		70	1.2	58	69	4.0
STATE	280.0					
USED TISSUE TEST		1	1.0	82	81	0.3
NO TISSUE TEST		91	1.4	44	61	15.5

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY MANURE APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
MANURE APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH MANURE		-				
WITHOUT MANURE		100	1.4	41	59	11.5
REGION 2	84.0					
WITH MANURE		4	2.0	41	80	0.3
WITHOUT MANURE		70	1.1	61	67	4.0
STATE	280.0					
WITH MANURE		1	2.0	41	80	0.3
WITHOUT MANURE		91	1.4	45	61	15.5

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

NITROGEN USAGE BY IRRIGATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
IRRIGATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
IRRIGATED		6	1.6	58	92	1.1
NON-IRRIGATED		94	1.4	40	56	10.4
REGION 2	84.0					
IRRIGATED		-				
NON-IRRIGATED		74	1.2	59	69	4.3
STATE	280.0					
IRRIGATED		4	1.6	58	92	1.1
NON-IRRIGATED		88	1.4	44	60	14.7

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE USAGE BY APPLICATION METHOD

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
APPLICATION METHOD	PLANTED ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BRDCST W/O INCORP		9	1.0	22	22	0.4
BRDCST W/ INCORP		3	1.0	32	32	0.2
IN SEED ROW		16	1.0	20	20	0.6
INJECTED/KNIFED		12	1.0	22	22	0.5
BANDED		41	1.0	24	24	1.9
REGION 2	84.0					
BRDCST W/O INCORP		7	1.0	38	38	0.2
BRDCST W/ INCORP		18	1.0	29	29	0.4
IN SEED ROW		7	1.0	24	24	0.1
INJECT/KNIFED		1	1.0	30	30	<u>3/</u>
BANDED		7	1.0	19	19	0.1
STATE	280.0					
BRDCST W/O INCORP		9	1.0	26	26	0.6
BRDCST W/ INCORP		7	1.0	30	30	0.6
IN SEED ROW		14	1.0	20	20	0.7
INJECT/KNIFED		8	1.0	23	23	0.5
BANDED		31	1.0	24	24	2.0

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

3/ Rounds to less than .1 million lbs.

PHOSPHATE USAGE BY TIMING OF APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TIMING OF APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
BEFORE SEEDING, FALL		12	1.0	23	23	0.5
BEFORE SEEDING, SPRING		6	1.0	29	29	0.3
AT SEEDING		46	1.0	25	25	2.3
AFTER SEEDING		17	1.0	15	15	0.5
REGION 2	84.0					
BEFORE SEEDING, FALL		1	1.0	30	30	<u>3/</u>
BEFORE SEEDING, SPRING		12	1.0	28	28	0.3
AT SEEDING		24	1.0	25	25	0.5
AFTER SEEDING		4	1.0	52	52	0.2
STATE	280.0					
BEFORE SEEDING, FALL		9	1.0	22	22	0.6
BEFORE SEEDING, SPRING		7	1.0	28	28	0.6
AT SEEDING		40	1.0	24	24	2.7
AFTER SEEDING		13	1.0	17	17	0.6

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

3/ Rounds to less than .1 million lbs.

PHOSPHATE USAGE BY STANDARD SOIL TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
SOIL TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH SOIL TEST		43	1.0	24	24	2.0
NO SOIL TEST		38	1.0	22	22	1.6
REGION 2	84.0					
WITH SOIL TEST		5	1.0	45	45	0.2
NO SOIL TEST		35	1.0	26	26	0.8
STATE	280.0					
WITH SOIL TEST		31	1.0	25	25	2.2
NO SOIL TEST		38	1.0	22	22	2.3

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE BY PLANT TISSUE TEST

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
PLANT TISSUE TEST	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) 2/
	ASB ACRES (000)	PCT TREATED 1/	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
USED TISSUE TEST		-				
NO TISSUE TEST		81	1.0	23	23	3.5
REGION 2	84.0					
USED TISSUE TEST		-				
NO TISSUE TEST		40	1.0	28	28	0.9
STATE	280.0					
USED TISSUE TEST		-				
NO TISSUE TEST		69	1.0	23	23	4.4

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE USAGE BY MANURE APPLICATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
MANURE APPLICATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
WITH MANURE		-				
WITHOUT MANURE		81	1.0	22	22	3.5
REGION 2	84.0					
WITH MANURE		4	1.0	52	52	0.2
WITHOUT MANURE		36	1.0	26	26	0.8
STATE	280.0					
WITH MANURE		1	1.0	49	49	0.1
WITHOUT MANURE		68	1.0	22	22	4.3

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

PHOSPHATE USAGE BY IRRIGATION

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
IRRIGATION	ACRES		APPLICATION RATES			TOTAL APPLIED CROP YEAR (MILL. LBS) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
IRRIGATED		6	1.0	24	24	0.3
NON-IRRIGATED		75	1.0	22	22	3.2
REGION 2	84.0					
IRRIGATED		-				
NON-IRRIGATED		40	1.0	28	28	1.0
STATE	280.0					
IRRIGATED		4	1.0	23	23	0.3
NON-IRRIGATED		65	1.0	23	23	4.1

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ May not add due to rounding.

GENERAL FERTILIZER PRACTICES

SPECIAL PRACTICES, BY REGION, 1999		
REGION	PERFORMED SOIL TEST	PERFORMED PLANT TISSUE TEST
----- PERCENT -----		
REGION 1	31	-
REGION 2	14	2
STATE	24	1

SPECIAL PRACTICES, BY REGION, 1999				
REGION	PERFORMED STANDARD SOIL TESTS IN 1998 OR 1999	PERFORMED PLANT TISSUE TESTS IN 1998 OR 1999	PERFORMED A NITROGEN SOIL TEST	POUNDS OF NITROGEN RECOMMENDED BY TEST
----- PERCENT -----		PERCENT		
REGION 1	31	-	27	60
REGION 2	14	<u>1/</u>	21	68
STATE	24	<u>1/</u>	25	63

1/ Insufficient data to publish.

AMOUNT OF NITROGEN APPLIED, BY REGION, 1999						
REGION	BASED ON					
	ROUTINE PRACTICE	SOIL OR TISSUE TEST	CONSULTANT RECOMMEN- DATION	FERTILIZER DEALER RECOMMEN- -DATION	EXTENSION SERVICE RECOMMEN- -DATION	COST OF NITROGEN OR COMMODITY PRICE
----- PERCENT -----						
REGION 1	64	20	18	20	<u>1/</u>	7
REGION 2	72	17	10	7	-	10
STATE	67	19	15	15	<u>1/</u>	8

1/ Insufficient data to publish.

GENERAL FERTILIZER PRACTICES

LIME APPLICATION, BY REGION, 1999			
REGION	LIME APPLIED	AVERAGE TIME BETWEEN APPLICATIONS	AVERAGE APPLICATION RATES
	PERCENT	YEARS	TONS PER ACRE
REGION 1	<u>1/</u>	<u>1/</u>	<u>1/</u>
REGION 2	14	7	2.3
STATE	7	6	2.4

1/ Insufficient data to publish.

SULFUR APPLICATIONS, BY REGION, 1999		
REGION	SULFUR APPLIED	RATE PER APPLICATION
	PERCENT	POUNDS PER ACRE
REGION 1	9	6
REGION 2	<u>1/</u>	<u>1/</u>
STATE	6	6

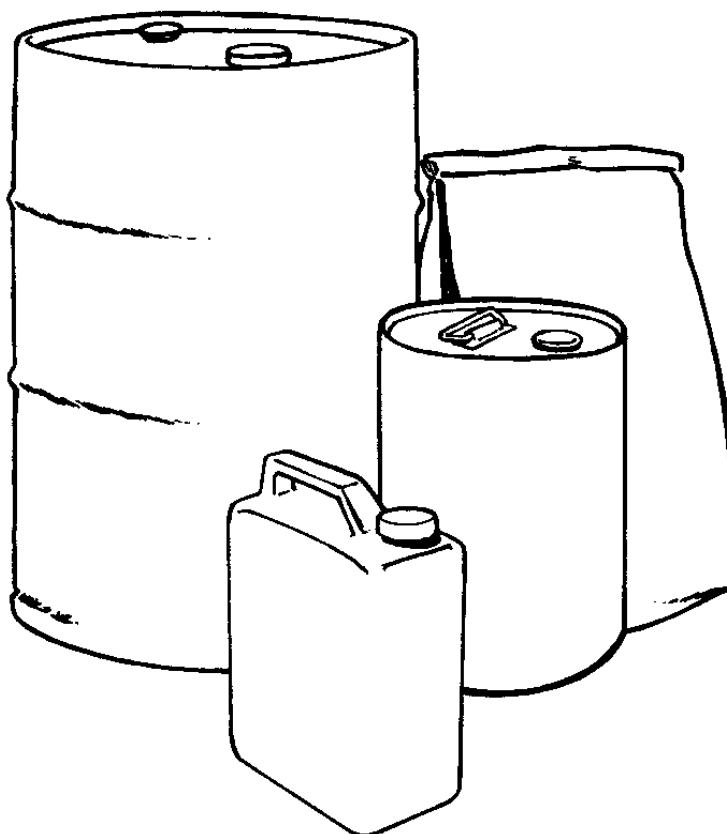
1/ Insufficient data to publish.

MICRONUTRIENTS, BY REGION, 1999		
REGION	MICRO NUTRIENTS APPLIED	THOSE WHO APPLIED MICRO NUTRIENTS APPLIED THE FOLLOWING PRODUCT
		ZINC
		----- PERCENT -----
REGION 1	7	100
REGION 2	7	100
STATE	7	100

PESTICIDE USAGE BY TYPE OF PESTICIDE

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND TOTAL POUNDS APPLIED, BY REGION, 1999			
TYPE OF PESTICIDE	PLANTED ACRES		TOTAL LBS. APPLIED (000)
	ASB ACRES (000)	PCT TREATED <u>1/</u>	
REGION 1	196.0		
HERBICIDES		96	171.0
INSECTICIDES		65	62.0
REGION 2	84.0		
HERBICIDES		52	50.0
INSECTICIDES		34	5.0
STATE	280.0		
HERBICIDES		82	221.0
INSECTICIDES		56	67.0

1/ Refers to acres receiving one or more applications of a specific pesticide ingredient.



PESTICIDE USAGE BY ACTIVE INGREDIENTS

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF PESTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
HERBICIDES <u>3/</u>						
REGION 1	196.0					
PENDIMETHALIN		37	1.0	1.06	1.06	76.8
GLYPHOSATE		26	1.4	0.58	0.81	40.4
TRIFLURALIN		17	1.0	0.77	0.77	26.2
SETHOXYDIM		<u>4/</u>				
SULFENTRAZONE		6	1.0	0.19	0.19	2.2
ETHALFLURALIN		<u>4/</u>				
REGION 2	84.0					
PENDIMETHALIN		41	1.1	1.08	1.15	39.2
GLYPHOSATE		12	1.1	0.43	0.46	4.6
TRIFLURALIN		6	1.0	0.92	0.92	4.6
SETHOXYDIM		<u>4/</u>				
SULFENTRAZONE		-				
ETHALFLURALIN		<u>4/</u>				
STATE	280.0					
PENDIMETHALIN		38	1.0	1.07	1.09	116.0
GLYPHOSATE		21	1.3	0.56	0.76	45.0
TRIFLURALIN		14	1.0	0.79	0.79	31.0
SETHOXYDIM		12	1.0	0.37	0.37	12.0
SULFENTRAZONE		4	1.0	0.19	0.19	2.2
ETHALFLURALIN		1	1.0	0.91	0.91	1.6
INSECTICIDES <u>5/</u>						
REGION 1	196.0					
METHYL PARATHION		63	1.1	0.32	0.36	43.7
ESFENVALERATE		45	1.0	0.03	0.03	2.5
LAMBDA-CYHALOTHRIN		4	1.0	0.02	0.02	0.1
CYFLURATHRIN		-				
CARBOFURAN		-				
REGION 2	84.0					
METHYL PARATHION		15	1.0	0.19	0.19	2.3
ESFENVALERATE		14	1.1	0.04	0.04	0.5
LAMBDA-CYHALOTHRIN		12	1.0	0.02	0.02	0.2
CYFLURATHRIN		6	1.0	0.04	0.04	0.2
CARBOFURAN		6	1.0	0.20	0.20	1.0
STATE	280.0					
METHYL PARATHION		49	1.1	0.31	0.34	46.0
ESFENVALERATE		32	1.0	0.03	0.03	3.0
LAMBDA-CYHALOTHRIN		5	1.0	0.02	0.02	0.3
CYFLURATHRIN		2	1.0	0.04	0.04	0.2
CARBOFURAN		2	1.0	0.20	0.20	1.0

1/ Refers to acres receiving one or more applications of a specific pesticide ingredient.

2/ May not add due to rounding.

3/ Herbicides reported but not published due to insufficient data include 2, 4-D, Dicamba, and Metolachlor.

4/ Insufficient data to publish.

5/ Insecticides reported but not published due to insufficient data include Chlorpyrifos and Endosulfan.

HERBICIDE USAGE BY TARGET PEST

ANNUAL GRASSES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		16	1.0	0.96	0.96	30.3
GLYPHOSATE		15	1.1	0.55	0.60	18.2
REGION 2	84.0					
PENDIMETHALIN		10.0	1.3	0.95	1.19	10.1
GLYPHOSATE		<u>3/</u>				
STATE	280.0					
PENDIMETHALIN		14	1.1	0.96	1.03	40.4
GLYPHOSATE		12	1.1	0.55	0.58	19.4

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

FOXTAIL

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		<u>3/</u>				
REGION 2	84.0					
PENDIMETHALIN		<u>3/</u>				
STATE	280.0					
PENDIMETHALIN		3	1.0	1.35	1.35	12.8

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

PERENNIAL GRASSES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		<u>3/</u>				
REGION 2	84.0					
PENDIMETHALIN		6	1.0	0.98	0.98	5.3
STATE	280.0					
PENDIMETHALIN		2	1.0	0.88	0.88	5.7

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

ANNUAL BROADLEAVES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
TRIFLURALIN		16	1.0	0.76	0.76	23.2
PENDIMETHALIN		6	1.0	1.33	1.33	14.7
GLYPHOSATE		<u>3/</u>				
REGION 2	84.0					
TRIFLURALIN		-				
PENDIMETHALIN		7	1.0	1.14	1.14	6.9
GLYPHOSATE		<u>3/</u>				
STATE	280.0					
TRIFLURALIN		11	1.0	0.76	0.76	23.2
PENDIMETHALIN		6	1.0	1.26	1.26	21.6
GLYPHOSATE		3	1.0	0.42	0.42	3.4

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

PIGWEEED

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
GLYPHOSATE		6	1.0	0.53	0.53	6.3
PENDIMETHALIN		3	1.0	0.87	0.87	4.3
REGION 2	84.0					
GLYPHOSATE		<u>3/</u>				
PENDIMETHALIN		-				
STATE	280.0					
GLYPHOSATE		4	1.0	0.53	0.53	6.4
PENDIMETHALIN		2	1.0	0.87	0.87	4.3

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

KOCHIA

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
GLYPHOSATE		<u>3/</u>				
REGION 2	84.0					
GLYPHOSATE		<u>3/</u>				
STATE	280.0					
GLYPHOSATE		7	1.0	0.73	0.73	13.3

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.

HERBICIDE USAGE BY TARGET PEST

ALL BROADLEAVES

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF HERBICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
PENDIMETHALIN		-				
REGION 2	84.0					
PENDIMETHALIN		14	1.0	1.26	1.26	14.7
STATE	280.0					
PENDIMETHALIN		4	1.0	1.26	1.26	14.7

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ May not add due to rounding.



INSECTICIDE USAGE BY TARGET PEST

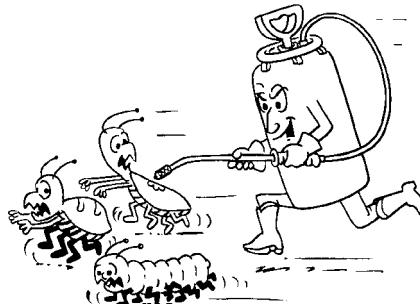
SUNFLOWER MOTH

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
METHYL PARATHION		24	1.0	0.38	0.38	17.7
CYFLUTHRIN		-				
REGION 2	84.0					
METHYL PARATHION		-				
CYFLUTHRIN		5	1.0	0.04	0.04	0.2
STATE	280.0					
METHYL PARATHION		16	1.0	0.38	0.38	17.7
CYFLUTHRIN		1	1.0	0.04	0.04	0.2

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

3/ Insufficient data to publish.



INSECTICIDE USAGE BY TARGET PEST

STEM WEEVIL

TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI-CATIONS	RATE PER APPLI-CATION	RATE PER CROP YEAR	
REGION 1	196.0					
ESFENVALERATE		24	1.0	0.03	0.03	1.4
REGION 2	84.0					
ESFENVALERATE		-				
STATE	280.0					
ESFENVALERATE		17	1.0	0.03	0.03	1.4

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

INSECTICIDE USAGE BY TARGET PEST

SEED WEEVIL

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI-CATIONS	RATE PER APPLI-CATION	RATE PER CROP YEAR	
REGION 1	196.0					
METHYL PARATHION		15	1.0	0.39	0.39	11.3
ESFENVALERATE		17	1.0	0.04	0.04	1.2
REGION 2	84.0					
METHYL PARATHION		-				
ESFENVALERATE		-				
STATE	280.0					
METHYL PARATHION		10	1.0	0.39	0.39	11.3
ESFENVALERATE		12	1.0	0.04	0.04	1.2

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

INSECTICIDE USAGE BY TARGET PEST

MOTH/CATERPILLAR

TOTAL ACREAGE, PERCENT OF ACRES TREATED, AND APPLICATION RATES, BY REGION, 1999						
TYPE OF INSECTICIDE	PLANTED ACRES		APPLICATION RATES			TOTAL LBS. APPLIED CROP YEAR (000) <u>2/</u>
	ASB ACRES (000)	PCT TREATED <u>1/</u>	MEAN NUMBER APPLI- CATIONS	RATE PER APPLI- CATION	RATE PER CROP YEAR	
REGION 1	196.0					
METHYL PARATHION		11	1.7	0.32	0.53	11.3
LAMBDA-CYHALOTHRIN		-				
ESFENVALERATE		-				
REGION 2	84.0					
METHYL PARATHION		6	1.0	0.28	0.28	1.4
LAMBDA-CYHALOTHRIN		10	1.0	0.02	0.02	0.2
ESFENVALERATE		4	1.2	0.06	0.08	0.2
STATE	280.0					
METHYL PARATHION		9	1.5	0.31	0.31	12.7
LAMBDA-CYHALOTHRIN		5	1.0	0.02	0.02	0.3
ESFENVALERATE		1	1.2	0.06	0.08	0.2

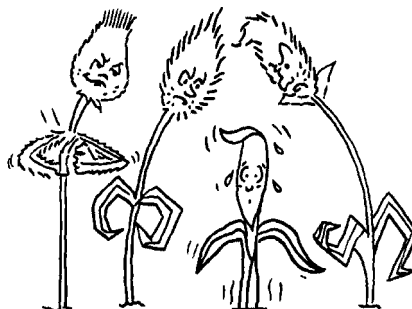
1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ May not add due to rounding.

HERBICIDE USAGE BY APPLICATION METHOD

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATION METHOD	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
BRDCST W/O INCORP		38
BRDCST W/ INCORP		34
BROADCAST AIR		20
FOLIAR/DIRECT SPRAY		4
REGION 2	84.0	
BRDCST W/O INCORP		40
BRDCST W/ INCORP		10
BROADCAST AIR		2
FOLIAR/DIRECT SPRAY		-
STATE	280.0	
BRDCST W/O INCORP		38
BRDCST W/ INCORP		27
BROADCAST AIR		15
FOLIAR/DIRECT SPRAY		2

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.



HERBICIDE USAGE BY TIMING OF APPLICATION

TOTAL ACREAGE AND PERCENT OF ACRES TREATED BY REGION, 1999		
TIMING OF APPLICATION	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
BEFORE PLANTING		65
AFTER PLANTING		30
REGION 2	84.0	
BEFORE PLANTING		34
AFTER PLANTING		18
STATE	280.0	
BEFORE PLANTING		55
AFTER PLANTING		27

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

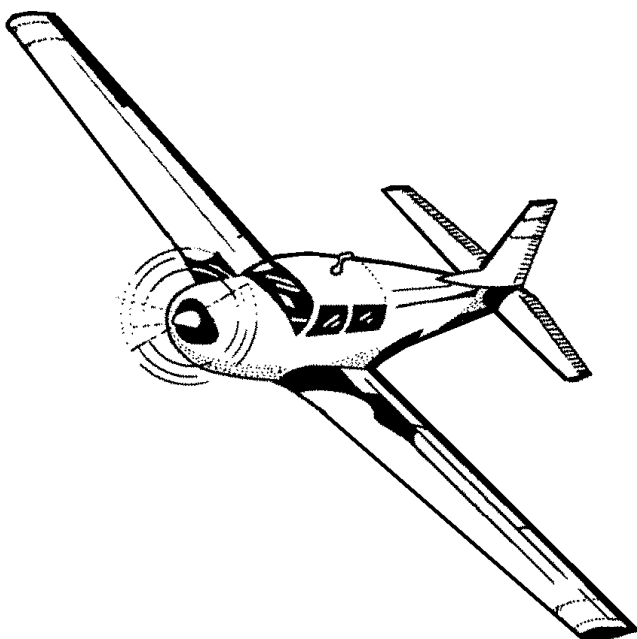


HERBICIDE USAGE BY APPLICATOR

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATOR	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
OPERATOR		20
CUSTOM		75
EMPLOYEE/OTHER		<u>2/</u>
REGION 2	84.0	
OPERATOR		14
CUSTOM		38
EMPLOYEE/OTHER		-
STATE	280.0	
OPERATOR		18
CUSTOM		63
EMPLOYEE/OTHER		<u>2/</u>

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ Insufficient data to publish.

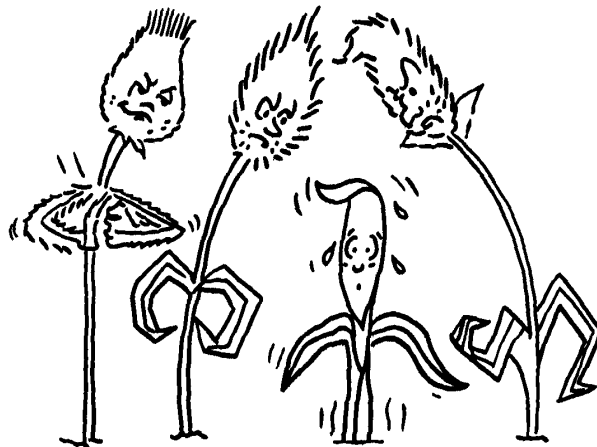


INSECTICIDE USAGE BY APPLICATION METHOD

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATION METHOD	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
BROADCAST AIR		65
FOLIAR/DIRECT SPRAY		-
IN SEED FURROW		-
REGION 2	84.0	
BROADCAST AIR		27
FOLIAR/DIRECT SPRAY		<u>2/</u>
IN SEED FURROW		<u>2/</u>
STATE	280.0	
BROADCAST AIR		<u>54</u>
FOLIAR/DIRECT SPRAY		<u>2/</u>
IN SEED FURROW		<u>2/</u>

1/ Refers to acres receiving one or more applications of a specific herbicide ingredient.

2/ Insufficient data to publish.



INSECTICIDE USAGE BY APPLICATOR

TOTAL ACREAGE AND PERCENT OF ACRES TREATED, BY REGION, 1999		
APPLICATOR	ACRES	
	ASB ACRES (000)	PCT ACRES TREATED <u>1/</u>
REGION 1	196.0	
OPERATOR		-
CUSTOM		65
REGION 2	84.0	
OPERATOR		<u>2/</u>
CUSTOM		30
STATE	280.0	
OPERATOR		<u>2/</u>
CUSTOM		55

1/ Refers to acres receiving one or more applications of a specific insecticide ingredient.

2/ Insufficient data to publish.

RECORDS USE

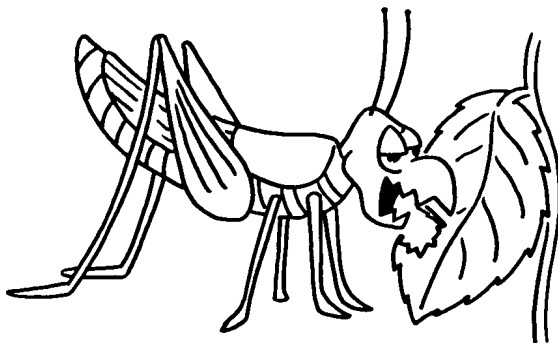
USE OF RECORDS TO PROVIDE SURVEY DATA, BY REGION, 1999		
REGION	FERTILIZER	PESTICIDE
	----- PERCENT -----	
REGION 1	60	56
REGION 2	33	45
STATE	48	52

PEST MANAGEMENT PRACTICES

FIELD SCOUTING FOR PESTS, BY REGION, 1999					
PEST BY REGION	SCOUTED PERCENT	BY			
		OPERATOR	EMPLOYEE	DEALER	CONSULTANT
		----- PERCENT -----			
FOR WEEDS					
REGION 1	93	82	<u>1/</u>	<u>1/</u>	12
REGION 2	67	89	<u>1/</u>	<u>1/</u>	<u>1/</u>
STATE	81	85	<u>1/</u>	4	9
FOR INSECTS					
REGION 1	95	77	-	10	13
REGION 2	79	85	<u>1/</u>	9	<u>1/</u>
STATE	88	80	<u>1/</u>	9	9
FOR DISEASES					
REGION 1	91	80	-	8	12
REGION 2	64	81	<u>1/</u>	<u>1/</u>	<u>1/</u>
STATE	79	81	<u>1/</u>	8	10

1/ Insufficient data to publish.

RECORDS OF SCOUTING, BY REGION, 1999	
REGION	KEPT RECORDS ON PEST ACTIVITY OR LEVEL
----- PERCENT OF FIELDS -----	
REGION 1	19
REGION 2	18
STATE	19



PEST MANAGEMENT PRACTICES

APPLIED PRE-EMERGENCE HERBICIDES, BY REGION, 1999					
REGION	APPLIED PERCENT	BASED ON			
		ROUTINE TREATMENT	FIELD MAPPING	RECOMMENDATION BY CHEMICAL DEALER	CROP CONSULTANT
		----- PERCENT -----			
REGION 1	75	85	<u>1/</u>	17	10
REGION 2	71	90	<u>1/</u>	17	13
STATE	73	87	<u>1/</u>	17	11

1/ Insufficient data to publish.

APPLIED POST-EMERGENCE HERBICIDES, BY REGION, 1999					
REGION	APPLIED PERCENT	BASED ON			
		ROUTINE TREATMENT	TYPE &/OR DENSITY OF WEEDS	RECOMMENDATION BY CHEMICAL DEALER	CROP CONSULTANT
		----- PERCENT -----			
REGION 1	20	91	36	36	<u>1/</u>
REGION 2	14	50	50	<u>1/</u>	-
STATE	18	76	41	29	<u>1/</u>

1/ Insufficient data to publish.

APPLIED INSECTICIDES, BY REGION, 1999					
REGION	BASED ON				
	PREVENTATIVE SCHEDULE	SCOUTING DATA COMPARED TO UNIV. GUIDELINES	STANDARD PRACTICES	LOCAL INFORMATION	OPERATOR'S DETERMINATION OF INFESTATION
----- PERCENT -----					
REGION 1	19	43	29	<u>1/</u>	52
REGION 2	20	32	36	-	64
STATE	20	37	33	<u>1/</u>	59

1/ Insufficient data to publish.

PEST MANAGEMENT PRACTICES

PEST CONTROL PRACTICES, BY REGION, 1999			
MANAGEMENT PRACTICE	REGION		
	1	2	STATE
	PERCENT OF PRODUCERS		
PROTECTION OF BENEFICIAL ORGANISMS	15	19	16
USE OF BENEFICIAL ORGANISMS	<u>1/</u>	7	5
USE OF WATER MANAGEMENT PRACTICES	<u>1/</u>	<u>1/</u>	3
TILLING, MOWING, BURNING, OR CHOPPING FIELD EDGES	25	21	24
CLEAN EQUIPMENT AND IMPLEMENTS	36	31	34
CULTIVATED FOR WEED CONTROL	47	19	35
PEST-RESISTANT SEED VARIETY	18	24	21
TREATED SEED	13	33	22
ADJUST PLANTING OR HARVESTING DATE	31	36	33
ALTERNATING PESTICIDES	22	36	28
ADJUST ROW SPACING OR PLANT DENSITY	11	<u>1/</u>	7
CROP ROTATION PAST 3 YEARS	56	76	65

1/ Insufficient data to publish.

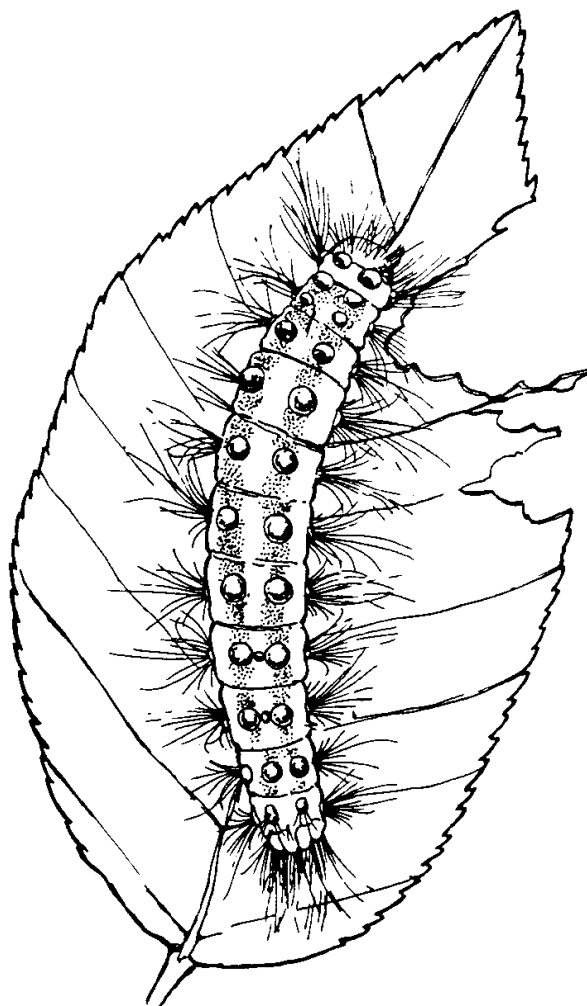
PEST MANAGEMENT PRACTICES

INFORMATION SOURCES, BY REGION, 1999				
REGION	UNIVERSITY RESEARCH AND EXTENSION	FARM SUPPLY OR CHEMICAL DEALER	COMMERCIAL SCOUTING	CROP CONSULTANT
----- PERCENT -----				
REGION 1	15	33	<u>1</u> /	18
REGION 2	31	36	<u>1</u> /	<u>1</u> /
STATE	22	34	<u>1</u> /	12
REGION	OTHER GROWERS	PRODUCER ASSOCIATION	OTHER	NONE
----- PERCENT -----				
REGION 1	16	<u>1</u> /	9	5
REGION 2	<u>1</u> /	<u>1</u> /	<u>1</u> /	12
STATE	11	3	7	8

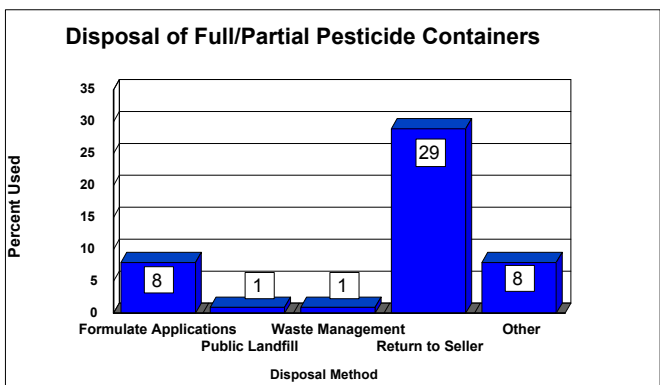
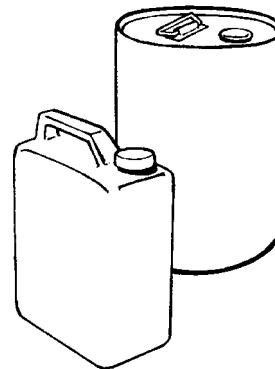
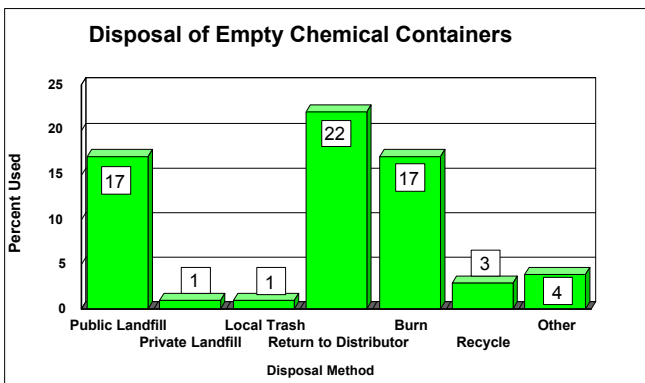
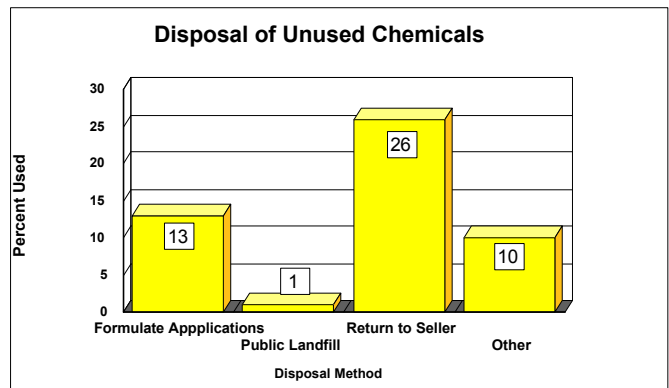
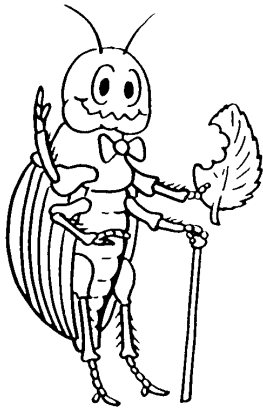
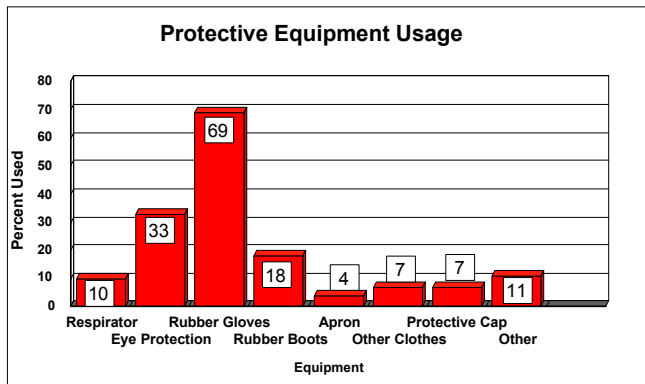
1/ Insufficient data to publish.

PEST MANAGEMENT PRACTICES

PESTICIDE USE TRAINING, BY REGION, 1999		
REGION	OPERATOR ATTENDED TRAINING OF PEST IDENTIFICATION AND MANAGEMENT SINCE OCTOBER 1, 1998	OPERATOR CERTIFIED TO APPLY "RESTRICTED USE" PESTICIDES
	----- PERCENT -----	
REGION 1	24	71
REGION 2	19	62
STATE	22	67



HANDLING OF CHEMICALS



1999 KSU SUNFLOWER ARMS SUPPLEMENT

ID _ _ _ _ _

PART I -- SEED TREATMENT

1. Was the seed used to plant the selected field treated with an insecticide or a fungicide?
 Yes - Enter code 1 and continue
 No - Go to Part II

600

- 1a. If yes, please identify the product or products used to treat the sunflower seed used to plant the selected field.

602
603
604

PART II -- FERTILIZER

1. Was sulfur applied to the sample field?
 Yes - Enter code 1 and continue
 No - Go to Question 2

605

- 1a. If yes, how many pounds were applied per acre?

606

2. Were any micro nutrients applied to the sample field?
 Yes - Enter code 1 and continue
 No - Go to Part III

607

- 2a. If yes, please check (✓) items applied:

Boron

608

Chloride . .

609

Zinc

610

Other

611

PART III -- GENERAL

1. What personal protective equipment do you use or provide to employees or family members who handle chemicals (pesticides/fertilizers) used on your sunflower acres?

Please check (✓) items that apply:

Respirator	620	Apron	624
Eye Protection	621	Other Clothes	625
Rubber Gloves	622	Protective Cap	626
Rubber Boots	623	Other (Specify _____)	627

2. Where do you dispose of empty chemical containers (pesticides/fertilizer) used on your sunflower acres?

Please check (✓) items that apply:

Public Landfill	630	Burn	634
Private Landfill	631	Recycle	635
Local Trash Pickup . .	632	Other (Specify _____)	636
Return to Distributor	633		

3. How do you dispose of unused chemicals (pesticides/fertilizers) purchased for application on your sunflower acres?

Please check (✓) items that apply:

	Unused Spray Mix		Full/Partial Containers
Formulate with other applications .	640	650
Public Landfill	641	651
Septic Tanks	642	652
Waste Management Contractor . .	643	653
Return to Seller	645	654
Other (Specify _____) .	645	655